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Long Term Resource Monitoring Program

Program Report

93-P005R

Geospatial Application: Production ARCEDIT

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Geospatial Application: Production ARCEDIT

by

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Preface

The Long Term Resource Monitoring Program (LTRMP) was authorized under the Water Resources Development Act of 1986 (Public Law 99-662) as an element of the U.S. Army Corps of Engineers' Environmental Management Program. The LTRMP is being implemented by the Environmental Management Technical Center, an office of the National Biological Service, in cooperation with the five Upper Mississippi River System (UMRS) States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin, with guidance and Program responsibility provided by the U.S. Army Corps of Engineers. The UMRS encompasses the commercially navigable reaches of the Upper Mississippi River, as well as the Illinois River and navigable portions of the Kaskaskia, Black, St. Croix, and Minnesota Rivers.

The mission of the LTRMP is to provide decision makers with information to maintain the UMRS as a sustainable large river ecosystem given its multiple-use character. The long-term goals of the Program are to understand the system, determine resource trends and impacts, develop management alternatives, manage information, and develop useful products.

This geospatial application supports LTRMP Operating Plan Task 4.3.1.2, *Adopt Standards for Data Acquisition and Storage* under Goal 4, *Provide for the Proper Management of Long Term Resource Monitoring Program Information* (USFWS 1992). The purpose of this application is to assist beginning ARC/INFO users in basic production work by providing a menu-driven subset of the core ARCEDIT commands. This report was developed with funding provided by the Long Term Resource Monitoring Program.

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Appendix A

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Geospatial Application:

Production ARCEDIT

By Douglas A. Olsen

Abstract

This geospatial application is targeted at beginning ARC/INFO users. Production ARCEDIT (PAE) is a menu-driven subset of the ARC/INFO module ARCEDIT. It is specifically designed for basic production work: digitizing, editing, and attributing. Many of the details of ARCEDIT are hidden from the PAE user and many of the more complex features are not included. The learning curve for production work is shortened by providing the new user with a friendly and consistent graphical user interface and a small subset of the core ARCEDIT commands.

What is Production ARCEDIT?

Production ARCEDIT (PAE) is a menu-driven subset of the ARC/INFO module ARCEDIT. It is designed for basic production work: digitizing, editing, and attributing. PAE is specifically targeted at beginning users. Many of the details of ARCEDIT are hidden from the PAE user and many of the more complex features are not included. The learning curve for production work is shortened by providing the new user with a friendly and consistent graphical user interface and a small subset of the core ARCEDIT commands.

Although PAE was designed for beginning ARC/INFO users, it does require a fundamental understanding of geographic information systems (GIS) concepts and terminology. Some specific ARC/INFO knowledge also is required to effectively use PAE. Both requirements can be satisfied by reading *Understanding GIS/The ARC/INFO Method* (ESRI 1992) through Lesson 7. A basic understanding of UNIX and the window manager on your system is assumed and is not addressed here.

A companion utility program, Production ARC, is included as Appendix A.

Running PAE

To run PAE, open a cmdtool window, move it to the lower right corner of your screen, and size it to about 10 dialog lines. Start up ARC, then type "pae." By default, PAE will place the main menu bar and the main graphics window in the upper left corner of the desktop computer.

Text Conventions

MAIN MENU BAR OPTIONS are in bold uppercase.

Submenu OPTIONS are in uppercase.

ARC/INFO COMMANDS are in uppercase italics.

Overview of the Production ARCEDIT Main Menu Bar

The **EDIT** menu changes, depending on the chosen edit feature (arcs, labels, tics) and includes options related to coverage editing, setting and changing tolerances, and attributing.

The **FILE** menu includes options for saving changes made to the edit coverage.

The **COVERAGE** menu includes options for choosing or creating an edit coverage, options for adding or removing background coverages, and options for GETting or PUTting to or from other coverages.

The **FEATURE** menu includes options for choosing the desired edit feature.

The **DRAW** menu includes options for drawing selected features and options for setting drawing parameters for the edit and background coverages.

The **SELECT** menu activates the selection tool for controlling the subsetting of features.

The **MAP REGISTRATION** menu is for preparing a new or existing coverage for digitizing.

The **QUERY** menu includes options for measuring, locating, and performing statistical analyses on the selected feature set.

The **EXIT** menu includes options for quitting PAE or temporarily exiting to the command line.

EDIT (Edit Feature Arc)

Note: When the edit feature is label or tic, the **EDIT** menu will have a subset of the following:

CHANGE TOLERANCES brings up a submenu of tolerances which can be manually altered. Tolerances should not be manually altered except in special cases specified by the production supervisor. The submenu choices are as follows:

WEED TOLERANCE
Sets the minimum distance between vertices for *ADD*ed arcs.

ARC SNAPPING
Turns arc snapping on or off and specifies a distance within which the arc ends will be snapped to existing arcs.

NODE SNAPPING
Specifies the maximum distance between nodes for snapping to occur.

INTERSECT ARCS
Turns on or off the automatic creation of nodes at arc intersections when *ADD*ing arcs.

DUPLICATE ARCS
Specifies whether or not an arc that has the same two nodes as an existing arc can be *ADD*ed.

AUTO INCREMENT
Specifies whether or not the User-IDs of subsequently *ADD*ed features will be automatically incremented or set to unique values.

SELECT DISTANCE
Specifies the maximum distance within which features can be selected with the mouse. This distance is shown as a circle around the center of the crosshairs when selecting features.

BACKGROUND SNAPPING turns background snapping on or off and chooses the background coverage, background feature, and the snap distance to use when snapping edit features to the selected background coverage feature.

ATTRIBUTE brings up a submenu of options related to viewing attribute tables and editing attributes. The submenu options are as follows:

LIST ARC ATTRIBUTE TABLE
Lists the current edit coverage's attribute table (for edit feature label, it will be the polygon/point attribute table, and for edit feature tic, it will be the tic table).

LIST ITEM DEFINITIONS
Lists the item (field) definitions for the edit coverage attribute table.

UPDATE SELECTED RECORDS
Allows you to update the attributes for features in the selected set. See "Attributing with PAE" for more information on how to use this menu.

ADD ARCS adds arcs to your coverage and changes based on the edit feature selected. If the edit feature is label, this option adds labels; if the edit feature is tic, it adds tics. Choosing this option puts you into a text-based menu in your cmdtool window. If you are digitizing, use the digitizer cursorpad to enter the number of the option you wish to use. If you are editing, then use the mouse or keyboard to enter the option number. Choosing option 9 (quit) returns you to the EDIT menu. See "Digitizing with PAE" for more information.

MOVE NODES allows you to move nodes in your edit coverage. Choosing this option puts you in a text-based menu in your cmdtool window. Use the mouse buttons or the keyboard to select the option number you wish to use. Choosing option 9 (quit) returns you to the EDIT menu.

EXTEND brings up a submenu of choices for extending a selected dangling arc. The arc is extended to the distance specified so that it intersects an existing arc, thus eliminating undershoots. The submenu options are as follows:

BOTH
Extends both the from-node and the to-node to the distance specified.

FROM-NODE
Extends only the from-node to the distance specified.

TO-NODE
Extends only the to-node to the distance specified.

VERTEX brings up a submenu of options for operating on vertices within a selected arc. The submenu choices are as follows:

ADD
Puts you into a text-based menu in your cmdtool window and prompts you to point at the location for the new vertex. Choosing option 9 (quit) returns you to the EDIT menu.

MOVE
Puts you into a text-based menu in your cmdtool window containing options for selecting and moving vertices. Choosing option 9 (quit) returns you to the EDIT menu.

DELETE
Puts you into a text-based menu in your cmdtool window and prompts you to point at the vertex to delete. After selecting the vertex, choose option 4 to delete. Choosing option 9 (quit) returns you to the EDIT menu.

OTHER brings up a submenu of options for altering a selected arc. The submenu options are as follows:

RESHAPE
Puts you into a text-based submenu in your cmdtool window, where you will have options for redigitizing portions of the arc selected. Input will be from the current input device. Use the number 1 button for adding vertices, the number 3 button for adding curves. The newly digitized arc must intersect the selected arc at least once. Choose option 9 (quit) to reshape the arc and return to the **EDIT** menu. See the *ARCEDIT Command Reference* (ESRI 1991a) for more information on the *RESHAPE* command.

SPLIT
Puts you into a text-based submenu in your cmdtool window, where you are prompted to point to where the selected arc should split.

UNSPLIT
This option requires you to have previously selected at least two arcs. *UNSPLIT* then combines the arcs by removing a shared pseudo-node. See the *ARCEDIT Command Reference* (ESRI 1991a) for more information on the *UNSPLIT* command.

SELECT allows you to create the initial subset of features. Choosing this option will bring up a submenu of choices for different types of graphical and logical *SELECT*ing. The submenu options are as follows:

SELECT ONE
Allows you to select one feature interactively. You are prompted to point at the desired feature with the current method of input. The selected feature is then highlighted in yellow.

SELECT MANY
Allows you to select many features, one at a time. You are put into a text-based submenu in your cmdtool window. Use the number 1 button (select) on your input device to select features. Features are highlighted in yellow as they are selected. Choose option 9 (quit) to return to the SELECT menu.

SELECT WITHIN BOX
Allows you to select many features at the same time by defining a bounding box. Only the features that fall entirely inside the box become selected. You are prompted to define the box with the current input device. The number of selected features is displayed in your cmdtool window. Use the DRAWSELECT option from the SELECT menu to highlight the selected features in yellow.

SELECT THRU BOX
Allows you to select many features at the same time by defining a bounding box. Features that are entirely or partially inside the box are selected. You are prompted to define the box with the current input device. The number of selected features is displayed in your cmdtool window. Use the DRAWSELECT option from the SELECT menu to highlight the selected features in yellow.

SELECT WITHIN POLYGON
Allows you to select many features at the same time by defining a bounding polygon. Features that fall entirely inside the polygon are selected. You are prompted to define the polygon with the current input device. Use option 9 (end) to close the polygon. The number of selected features is displayed in your cmdtool window. Use the DRAWSELECT option from the SELECT menu to highlight the selected features in yellow.

SELECT THRU POLYGON
Allows you to select many features at the same time by defining a bounding polygon. Features that fall entirely or partially inside the polygon are selected. You are prompted to define the box with the current input device. The number of selected features is displayed in your cmdtool window. Use the DRAWSELECT option from the SELECT menu to highlight the selected features in yellow.

SELECT CURRENT SCREEN
Allows you to select all the features that fall entirely within the current graphics window. The number of selected features is displayed in your cmdtool window. Use the DRAWSELECT option from the SELECT menu to highlight the selected features in yellow.

SELECT POLYGON OUTLINE
This option is available for edit feature arc only. Using this option, you can select the arcs bounding a given polygon. Position the cursor within the selection distance from an arc on the inside of the desired polygon and press any key. The number of arcs selected and the perimeter of the polygon are displayed in your cmdtool window and the selected arcs are highlighted in yellow in the graphics window.

SELECT PATH
This option is available for edit feature arc only. SELECT PATH allows you to calculate the shortest path between two selected arcs. In your cmdtool window, you are prompted to select a "from" arc and a "to" arc. The "from" and "to" arcs are selected along with the arcs on the shortest path between the two.

The number of arcs selected and their total length in mapunits are shown in your cmdtool window and the selected arcs are highlighted in yellow in the graphics window.

SELECT CONNECT
This option is available for edit feature arc only. This option is useful for selecting all of the arcs that intersect a selected set of arcs. After using SELECT CONNECT on a selected set, only the arcs that intersect the original set are selected. The original arcs are not in the resulting set.

SELECT DANGLE
This option is available for edit feature arc only. Choosing this option selects all dangling arcs in an edit coverage. The number of selected arcs is displayed in your cmdtool window. Use the DRAWSELECT option from the SELECT menu to highlight the selected features in yellow in the graphics window.

SELECT ALL
Selects all of the edit features in the current edit coverage. Use the DRAWSELECT option from the SELECT menu to highlight the selected features in yellow in the graphics window.

BUILD QUERY
Brings up a menu of options for building logical expressions to subset coverage features. See *Editing Coverages & Tables with ARCEDIT* (ESRI 1991b), section 7-5 for additional information on building logical expressions.

RESELECT
Creates a smaller subset from an existing set. Choosing this option brings up a submenu of choices for graphical and logical *RESELECT*ion. Refer to the SELECT options for definitions. The submenu options are as follows:

RESELECT ONE
RESELECT MANY
RESELECT WITHIN BOX
RESELECT THRU BOX
RESELECT WITHIN POLYGON
RESELECT THRU POLYGON
RESELECT CURRENT SCREEN
RESELECT POLYGON OUTLINE
RESELECT PATH
RESELECT CONNECT
RESELECT DANGLE
RESELECT ALL
BUILD QUERY

ASELECT
Allows you to add features to the selected set. Choosing this option brings up a submenu of choices for graphical and logical *ASELECT*ion. Refer to the SELECT options for definitions. The submenu choices are as follows:

ASELECT ONE
ASELECT MANY
ASELECT WITHIN BOX
ASELECT THRU BOX
ASELECT WITHIN POLYGON
ASELECT THRU POLYGON
ASELECT CURRENT SCREEN
ASELECT POLYGON OUTLINE
ASELECT PATH
ASELECT CONNECT
ASELECT DANGLE
ASELECT ALL
BUILD QUERY

UNSELECT
Allows you to remove features from a selected set. Choosing this option brings up a submenu of choices for graphical and logical *UNSELECT*ion. Refer to the SELECT options for definitions. The submenu choices are as follows:

UNSELECT ONE
UNSELECT MANY
UNSELECT WITHIN BOX
UNSELECT THRU BOX
UNSELECT WITHIN POLYGON
UNSELECT THRU POLYGON
UNSELECT CURRENT SCREEN
UNSELECT POLYGON OUTLINE

UNSELECT PATH
UNSELECT CONNECT
UNSELECT DANGLE
UNSELECT ALL
BUILD QUERY

NSELECT
Reverses the selected and unselected sets. Everything that was not selected becomes selected and vice-versa. The newly selected features are highlighted in yellow in the graphics window.

DRAWSELECT
Highlights selected features in yellow in the graphics window.

DELETE
Deletes all the features in a selected set.

UNDO
Undoes the last action.

DISMISS
Closes the SELECT menu.

FILE

SAVE saves any edits you have performed on the current edit coverage. You are prompted if the coverage needs topology rebuilt.

SAVE INTO NEW saves the changes made to the current edit coverage into a new coverage. You are prompted for the name of the new coverage, and the new coverage then becomes the active edit coverage. Changes made to the original edit coverage are not saved.

COVERAGE

CHOOSE EDIT COVERAGE prompts you for the pathname of the desired edit coverage. After choosing the desired coverage, you are guided through a series of menus asking for information about the edit coverage. Be sure to choose the proper options from these menus. The information given about the edit coverage is used to set the tolerances for your session. If for some reason the tolerances are not acceptable, you can change them with the CHANGE TOLERANCES option from the **EDIT** menu. Check with the production supervisor before changing any tolerances.

DIRECTORY opens a window showing all the coverages in the current workspace.

CREATE brings up a menu asking for the name of the new coverage. If you would like to use the tics and boundary from another coverage, check the box for this option. If you choose to take the tics and boundary from another coverage, a submenu prompts you for the name of that coverage. If you do not take the tics and boundary from another coverage, you are prompted from your cmdtool window to digitize at least four tics from the digitizer tablet.

BACKGROUND ADD brings up a menu asking for the pathname of the desired background coverage. You can then set the coverage to background coverage 1 (red) or background coverage 2 (green). For simplicity, PAE allows you to have only two background coverages. To set the drawing parameters for your background coverage, use the BACKGROUND SETTINGS option from the **DRAW** menu.

BACKGROUND REMOVE brings up a menu asking which of the two background coverages to remove. Checking the box next to the background coverage removes it from the current session.

STATUS brings up a menu showing the status of the current session.

GET FROM brings up a menu asking for the coverage to *GET* from. The features from the *GET* coverage that correspond to the current edit feature are appended to the current edit coverage along with their feature attributes.

PUT INTO NEW brings up a menu prompting you for the name of the new coverage to *PUT* the selected features into. Features, as well as any attribute information, will be copied into the new coverage.

PUT INTO EXISTING brings up a menu prompting you for the name of the existing coverage to *PUT* the selected features into. Features, as well as attribute information, will be copied into the existing coverage if the item definitions match.

FEATURE

ARCS changes the edit feature to arcs. The **EDIT** option now brings up a menu specific to editing arcs. The number of arcs in the current edit coverage is displayed in the cmdtool window.

LABELS changes the edit feature to labels. The **EDIT** option now brings up a menu specific to editing labels. The number of labels in the current edit coverage is displayed in the cmdtool window.

TICS changes the edit feature to tics. The **EDIT** option now brings up a menu specific to editing tics. The number of tics in the current edit coverage is displayed in the cmdtool window.

DRAW

DRAW redraws the graphics screen using the current draw settings.

DRAW SELECTION draws the selected set of features highlighted in yellow.

DRAW SETTINGS brings up a menu showing the available drawing options. Checking an option turns it on. Choosing the draw button redraws the coverage with the chosen draw settings.

BACKGROUND SETTINGS brings up a menu showing the available drawing options. Checking an option turns it on. Choosing the draw button redraws the coverage(s) with the chosen draw settings.

CLEAR clears the graphics display. Use the DRAW option from the EDIT menu or the DRAW option from the **DRAW** menu to redraw the current edit coverage and the chosen background coverages.

SELECT

Displays the same SELECT menu described above in the **EDIT** menu section. The SELECT menu is always the same, regardless of the edit feature.

MAP REGISTRATION

This option is for registering maps prior to digitizing and assumes that you have your map on the digitizing table ready to go. You are prompted from the cmdtool window to register at least four tics from the digitizer. See the section "Digitizing with PAE" for more information.

QUERY

WHERE puts you into a text-based submenu in your cmdtool window. Use any key to display the location (in map units) of the cursor on the graphics page. Use option 9 (quit) to return to the PAE main menu.

DISTANCE puts you into a text-based submenu in your cmdtool window. You are prompted to enter two points on the graphic display using any key. The distance between the two points is displayed in the cmdtool window. Use option 9 (quit) to return to the PAE main menu.

EXIT

EXECUTE ARCEDIT COMMANDS will allow you to temporarily shell out of PAE to the ARCEDIT command line. Type "&return" to return to PAE.

EXIT PAE causes PAE to terminate. You are prompted from your cmdtool window to save any unsaved edits.

Digitizing with PAE

Creating a New Coverage

1. Choose CREATE from the **COVERAGE** menu.

2. Fill in the name of the coverage you wish to create in the CREATE NEW COVERAGE submenu.

3. Choose whether or not to take tics and bnd files from an existing coverage. If you choose to take tics and bnd from another coverage, proceed to step #5.

4. At this point, you will be prompted from the cmdtool window to enter at least four new tics from the digitizer. Carefullyenter the locations for each tic by placing the crosshairs of the digitizer cursorpad exactly over the new tic center and entering:

   For the first tic: 1 A 1
   For the second tic: 2 A 1
   For the third tic: 3 A 1
   For the fourth tic: 4 A 1
   ...etc.
   After last tic: 0 A

   You are then prompted to enter the initial boundary for this new coverage. Use the number 1 key on the digitizer cursorpad to enter the upper right coverage boundary and the lower left coverage boundary. Make sure to enter a boundary that completely encompasses the map you are digitizing.

   You have now created a new coverage and defined its tics. The coverage is not registered at this point. PAE forces you to reregister the coverage through the **MAP REGISTRATION** menu. Reregistration ensures that the initial tic locations were digitized accurately. If when reregistering through the **MAP REGISTRATION** menu you cannot get the RMS error below the required tolerance, the original tic locations were probably digitized poorly and the coverage should be recreated.

5. Choose **MAP REGISTRATION** from the main menu bar.

6. At this point you will be prompted from the cmdtool window to enter at least four tic locations from the digitizer. Use the tic entry procedure from step #4. After entering the tic locations, the RMS error is displayed in the cmdtool window. The (dig) RMS error must be 0.005 or less. If it is not, you should reregister the coverage.

7. From the **EDIT** menu, choose the ADD option to add features to your coverage. This option will put you into a text-based menu in the cmdtool window. Use the options available to add features to your coverage. Option 9 (quit) returns you to the **EDIT** menu.

Digitizing with an Existing Coverage

1. From the **COVERAGE** menu, choose the CHOOSE EDIT COVERAGE option and select the coverage to be digitized.

2. Choose **MAP REGISTRATION** from the main menu bar.

3. At this point, you are prompted from the cmdtool window to register at least four existing tic locations from the digitizer. Carefully enter the locations for each tic by

placing the crosshairs of the digitizer cursorpad exactly over the new tic center and entering:

For the first tic: 1 A 1
For the second tic: 2 A 1
For the third tic: 3 A 1
For the fourth tic: 4 A 1
...etc.
After last tic: 0 A

After entering the tic locations, the RMS error will be displayed in the cmdtool window. The (dig) RMS error must be 0.005 or less. If it is not, you should reregister the coverage.

4. From the **EDIT** menu, choose the ADD option to add features to your coverage. This option will put you into a text-based menu in the cmdtool window. Use the options available to add features to your coverage. Option 9 (quit) returns you to the **EDIT** menu.

Editing with PAE

1. From the **COVERAGE** menu, choose the CHOOSE EDIT COVERAGE option and select the coverage to be edited.
2. From the **COVERAGE** menu, choose the BACKGROUND ADD option if you need a background coverage for your editing session.
3. From the **DRAW** menu, choose the DRAW SETTINGS option and select the appropriate drawing parameters for your editing session.
4. If you have selected a background coverage, choose the BACKGROUND SETTINGS option from the **DRAW** menu and select the appropriate background drawing parameters for your editing session.
5. Use the editing options available through the **EDIT** menu as well as the *GET* and *PUT* options available through the **COVERAGE** menu to modify your coverage as needed.
6. Be sure to frequently save changes during your editing session.

Attributing with PAE

This section will assume that:

- The coverage has been accurately digitized and checked by the production supervisor.
- The coverage has been edited, and the edits have been checked by the production supervisor.
- The coverage has topology.
- If it is a polygon coverage, labels have been created for each polygon.
- The desired items have been added to the feature attribute table.

1. Create a test plot of the coverage with the features labeled with their user-IDs.
2. From the **COVERAGE** menu, choose the CHOOSE EDIT COVERAGE option and select the coverage you wish to attribute and the appropriate edit feature.
3. From the main menu bar, choose the **EDIT** option.
4. Use the **SELECT** menu to select the features to be attributed.
5. From the ATTRIBUTE menu, choose the UPDATE SELECTED RECORDS option.
6. A menu appears listing the fields for the first record in the selected set. The item's covername# and covername-id already have values. The item you are updating is blank (character) or zero (numeric). Fill in the blank field by referencing the original

basemap/photo and/or the testplot, and enter the code (attribute) associated with the record (feature) displayed in the menu.

7. Use the NEXT and FIRST buttons to move through the selected set. The selected record (feature) is highlighted in yellow in the graphics window. Use the PAN/ZOOM button on the graphics window to move around in your coverage.

8. Pull the pin on the UPDATE SELECTED RECORDS menu to return to the **EDIT** menu. Use the SAVE option from the **FILE** menu to save the changes.

9. After attributing is complete, create another testplot with the features labeled with the new attribute. Check the value of the new attribute against the original basemap/photo for accuracy. Repeat steps 1-8 to correct any mistakes.

10. Have the production supervisor make a final quality assurance check of the attributing.

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Appendix A
Production ARC

Production ARC is a menu-driven subset of ARC/INFO commands related to production work: digitizing, editing, and attributing. It is intended to be used as a companion utility to the Production ARCEDIT program.

TOPOLOGY

BUILD
Creates or updates a feature attribute table for a coverage.

CLEAN
Generates a coverage with correct polygon or arc-node topology. CLEAN edits and corrects geometric coordinate errors, assembles arcs into polygons, and creates feature attribute information for each polygon or arc. When using CLEAN, be sure to accurately select the original basemap or photo scale, as this is how tolerances are determined. If the original scale is not an option from the CLEAN menu, then choose the closest larger scale.

CREATE LABELS

Creates labels for each polygon in a coverage or optionally creates new labels starting with a given user-id (id base) without altering existing labels or attribute information.

ITEM

ADDITEM
Adds item to coverage feature attribute table.

DROPITEM
Removes item from coverage feature attribute table.

QUADMAP

Takes any rectangular map sheet with lat/long coordinates for each corner and outputs a rectangular boundary coverage in the UTM projection in the zone of your choice. The output coverage will have tics at each corner, numbered 1 through 4.

ERRORS

NODE ERRORS
Lists coverage dangling nodes in cmdtool window.

LABEL ERRORS
Lists coverage label errors in cmdtool window.

REPORT

AREA REPORT

Builds textfile table of frequency and area in hectares for each unique occurrence of the desired item from coverage polygon attribute table. Coverage units must be meters and coverage must be in current directory.

QUIT

QUIT TO ARC COMMAND LINE

Exits temporarily to the ARC prompt. Type &return to return to Production ARC.

QUIT PRODUCTION ARC

Quits the Production ARC program.

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Geospatial Application: Production ARCEDIT (For beginning ARC/INFO users--provides a menu-driven subset of core ARCEDIT commands to assist in basic production work. Designed to allow for minimal training time in ARC/INFO prior to successfully using ARCEDIT to create spatial databases for the Upper Mississippi River System Long Term Resource Monitoring Program.)

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13. ABSTRACT (Maximum 200 words)

This geospatial application is targeted at beginning ARC/INFO users. Production ARCEDIT (PAE) is a menu-driven subset of the ARC/INFO module ARCEDIT. It is specifically designed for basic production work: digitizing, editing, and attributing. Many of the details of ARCEDIT are hidden from the PAE user and many of the more complex features are not included. The learning curve for production work is shortened by providing the new user with a friendly and consistent graphical user interface and a small subset of the core ARCEDIT commands

14. SUBJECT TERMS

ARC/INFO, ARCEDIT, AML, digitizing, attributing, editing, GIS

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The Long Term Resource Monitoring Program (LTRMP) for the Upper Mississippi River System was authorized under the Water Resources Development Act of 1986 as an element of the Environmental Management Program. The mission of the LTRMP is to provide river managers with information to maintain the Upper Mississippi River System as a sustainable large river ecosystem given its multiple-use character. The LTRMP is a cooperative effort by the National Biological Service, the U.S. Army Corps of Engineers, and the States of Illinois, Iowa, Minnesota, Missouri, and Wisconsin.

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END

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